Electronic Version

Stylesheet Version v1.1.1

Claims

[c1] 1. A process for refurbishing a worn surface of a component, the process comprising the steps of:

removing a surface region of the worn surface so as to define a repair surface on the component;

forming a braze tape from a slurry, the braze tape comprising a braze material and a wear-resistant alloy;

applying the braze tape to the repair surface;

heat treating the braze tape and the repair surface to cause the braze tape to diffusion bond to the repair surface so as to define a built-up surface; and then

machining the built-up surface to define a wear-resistant coating on the component.

[c2] 2. The process according to claim 1, wherein the powder of the braze material is dispersed in the braze tape in a matrix consisting essentially of the powder of the wear-resistant alloy.

[c3] 3. The process according to claim 1, wherein the braze tape is formed by a method comprising:

combining a powder of the braze material, a powder of the wear-resistant alloy, and a binder to form the slurry in which the powders are dispersed; and

forming and sintering the braze tape to remove the binder.

[c4] 4. The process according to claim 1, wherein the braze material consists of, by weight, about 22.5 to 24.25% chromium, about 9.0 to 11.0% nickel, about 6.5 to 7.5% tungsten, about 3.0 to 4.0% tantalum, about 2.6 to 3.0% boron, with the balance cobalt, minor alloying elements, and incidental impurities.

[c5] 5. The process according to claim 1, wherein the wear-resistant alloy consists of, by weight, about 27 to about 29% molybdenum, about 16.5 to about 17.5% chromium, about 3.0 to about 3.5% silicon, up to about 3% iron, up to about 3% nickel, with the balance cobalt, minor alloying elements, and incidental impurities.

[c6] 6. The process according to claim 5, wherein the braze material consists of, by weight, about 22.5 to 24.25% chromium, about 9.0 to 11.0% nickel, about 6.5 to 7.5% tungsten, about 3.0 to 4.0% tantalum, about 2.6 to 3.0% boron, with the balance cobalt, minor alloying elements, and incidental impurities, and the braze tape contains, by weight, about 10% to about 30% of the braze material and about 70% to about 90% of the wear-resistant alloy.

[c7] 7. The process according to claim 1, wherein the compo-

nent is a shroud support component of a turbomachine and the worn surface is on a support flange of the shroud support component, the support flange being adapted for supporting a shroud component of the turbomachine.

[c8] 8. A process for refurbishing a shroud support component of a gas turbine engine, the shroud support component having a forward flange having a forward lip and a forward face that have worn surfaces as a result of being in high compression contact with an outer band of a nozzle of the gas turbine engine, the process comprising the steps of:

disassembling the nozzle from the shroud support component;

removing a surface region from each of the worn surfaces so as to define repair surfaces on the shroud support component;

forming braze tapes by combining a powder of a braze material, a powder of a wear-resistant cobalt alloy, and a binder to form a slurry in which the powders are dispersed, and then forming and sintering to remove the binder, each of the braze tapes consisting of the braze material dispersed in a matrix material of the wear-resistant cobalt alloy;

attaching the braze tapes to the repair surfaces;

heat treating the braze tapes and the repair surfaces to cause the braze tapes to diffusion bond to the repair surfaces so as to define built-up surfaces; and then machining the built-up surfaces to define wear-resistant coatings on the shroud support component.

[c9] 9. The process according to claim 8, wherein the braze material consists of, by weight, about 22.5 to 24.25% chromium, about 9.0 to 11.0% nickel, about 6.5 to 7.5% tungsten, about 3.0 to 4.0% tantalum, about 2.6 to 3.0% boron, with the balance cobalt, minor alloying elements, and incidental impurities.

[c10] 10. The process according to claim 8, wherein the wear-resistant cobalt alloy consists of, by weight, about 27 to about 29% molybdenum, about 16.5 to about 17.5% chromium, about 3.0 to about 3.5% silicon, up to about 3% iron, up to about 3% nickel, with the balance cobalt, minor alloying elements, and incidental impurities.

[c11] 11. The process according to claim 10, wherein the braze material consists of, by weight, about 22.5 to 24.25% chromium, about 9.0 to 11.0% nickel, about 6.5 to 7.5% tungsten, about 3.0 to 4.0% tantalum, about 2.6 to 3.0% boron, with the balance cobalt, minor alloying elements, and incidental impurities, and the braze tape contains, by weight, about 19% to about 21% of the

braze material and the balance essentially the wear-resistant cobalt alloy.

[c12] 12. A refurbished shroud support component of a turbomachine, the shroud support component comprising a surface and a wear-resistant coating diffusion bonded to the surface, the wear-resistant coating having a machined surface that defines a wear surface of the shroud support component, the wear-resistant coating comprising a braze material dispersed in a matrix material of a wear-resistant alloy.

[c13] 13. The refurbished shroud support component according to claim 12, wherein the wear surface is on a support flange of the shroud support component, the support flange being adapted for supporting a shroud component of a turbomachine.

[c14] 14. The refurbished shroud support component according to claim 12, wherein the braze material consists of, by weight, about 22.5 to 24.25% chromium, about 9.0 to 11.0% nickel, about 6.5 to 7.5% tungsten, about 3.0 to 4.0% tantalum, about 2.6 to 3.0% boron, with the balance cobalt, minor alloying elements, and incidental impurities.

[c15] 15. The refurbished shroud support component accord-

ing to claim 12, wherein the wear-resistant alloy consists of, by weight, about 27 to about 29% molybdenum, about 16.5 to about 17.5% chromium, about 3.0 to about 3.5% silicon, up to about 3% iron, up to about 3% nickel, with the balance cobalt, minor alloying elements, and incidental impurities.

[c16] 16. The refurbished shroud support component according to claim 15, wherein the braze material consists of, by weight, about 22.5 to 24.25% chromium, about 9.0 to 11.0% nickel, about 6.5 to 7.5% tungsten, about 3.0 to 4.0% tantalum, about 2.6 to 3.0% boron, with the balance cobalt, minor alloying elements, and incidental impurities, and the braze tape contains, by weight, about 10% to about 30% of the braze material and about 70% to about 90% of the wear-resistant alloy.

[c17] 17. A refurbished shroud support component of a gas turbine engine, the shroud support component comprising:

a forward flange having a forward lip and a forward face; and

wear-resistant coatings diffusion bonded to the forward lip and the forward face, the wear-resistant coatings having machined surfaces adapted for high compression contact with an outer band of a nozzle of the gas turbine engine, the wear-resistant coatings consisting of a braze

material dispersed in a matrix material of a wear-resistant cobalt alloy.

[c18] 18. The refurbished shroud support component according to claim 17, wherein the braze material consists of, by weight, about 22.5 to 24.25% chromium, about 9.0 to 11.0% nickel, about 6.5 to 7.5% tungsten, about 3.0 to 4.0% tantalum, about 2.6 to 3.0% boron, with the balance cobalt, minor alloying elements, and incidental impurities.

[c19] 19. The refurbished shroud support component according to claim 17, wherein the wear-resistant cobalt alloy consists of, by weight, about 27 to about 29% molybdenum, about 16.5 to about 17.5% chromium, about 3.0 to about 3.5% silicon, up to about 3% iron, up to about 3% nickel, with the balance cobalt, minor alloying elements, and incidental impurities.

[c20] 20. The refurbished shroud support component according to claim 19, wherein the braze material consists of, by weight, about 22.5 to 24.25% chromium, about 9.0 to 11.0% nickel, about 6.5 to 7.5% tungsten, about 3.0 to 4.0% tantalum, about 2.6 to 3.0% boron, with the balance cobalt, minor alloying elements, and incidental impurities, and the braze tape contains, by weight, about 19% to about 21% of the braze material and the balance es-

sentially the wear-resistant cobalt alloy.